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CANADA BLUEGRASS:

ITS CULTURE AND USES.

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LETTER OF TRANSMITTAL.

U. S. Department of Agriculture,
Bureau of Plant Industry,
Office of the Chief,
Washington, D. C., April 15, 1910.

Sir: I have the honor to transmit herewith and to recommend for publication as a Farmers' Bulletin a paper entitled "Canada Bluegrass: Its Culture and Uses," prepared by Mr. R. A. Oakley, Assistant Agrostologist in the Office of Forage-Crop Investigations of this Bureau, under the direction of the agrostologist in charge.

The increasing realization of the agricultural value of Canada bluegrass has resulted in a demand for information regarding its habits, uses, and culture. This paper is intended to contain an agronomic discussion of this grass, embodying a description of the methods of culture and utilization now followed, and also some suggestions resulting from experiments conducted by the Bureau of Plant Industry. It is not the intention to justify in any way the practice of using Canada bluegrass as an adulterant of Kentucky bluegrass, since there are no grounds upon which such practice can be excused.

Respectfully,

B. T. Galloway,
Chief of Bureau.

Hon. James Wilson,
Secretary of Agriculture.

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CANADA BLUEGRASS: ITS CULTURE AND USES.

INTRODUCTION.

For several years Canada bluegrass has received considerable attention and has been the subject of more or less adverse comment from agriculturists in general. This has been due largely to the fact that the seed of Canada bluegrass has been used extensively as an adulterant of Kentucky bluegrass, in which rôle it is very undesirable. The malpractice in connection with its use as an adulterant of Kentucky bluegrass seed is doubtless responsible for the widespread unfavorable reputation which the grass now holds. This reputation has obtained to such an extent that the good qualities of the grass have been largely overlooked. When an example of a flagrant case of seed adulteration is called for, Canada bluegrass is always cited, and it has become so generally known in this connection that its name is considered by many as almost synonymous with "weed" and "pest."

That the grass has undesirable features must be admitted; nevertheless it is of more economic value in this country at the present time than many of our other cultivated grasses about which much has been said and written. It is the purpose of this paper to discuss Canada bluegrass from an agronomic standpoint, dealing primarily with its utilization and value as a forage grass.

DESCRIPTION OF CANADA BLUEGRASS.

Canada bluegrass (*Poa compressa* L.) is sometimes called Virginia bluegrass, wire-grass, and various other names, depending largely on the section in which it is grown. In localities where it is very common it is known simply as bluegrass. It differs in general from Kentucky bluegrass (*Poa pratensis* L.) in shape of stem, shape and color of leaves, and character of seed head, or panicle. The stems or culms are flattened or compressed and bear few leaves. They are more nearly solid than those of Kentucky bluegrass and constitute a characteristic by which the grass is readily distinguished. The

leaves are a dark bluish-green color, sometimes quite glaucous, and are shorter than those of Kentucky bluegrass and more scantily produced. The seed head, or panicle, is also a reliable distinguishing character, being quite compact and usually shorter than that of Kentucky bluegrass. (See figs. 1 and 2.)

FIG. 1.—A panicle of Canada bluegrass (*Poa compresa* L.). This seed head is longer than the average, but is typical in other respects.

Canada bluegrass is a very hardy perennial grass and produces an abundance of running rootstocks, which make it decidedly aggressive and enable it to form a dense, tough sod.

Although widely distributed throughout this country and found growing largely without cultivation, Canada bluegrass is considered by many botanists to have been introduced from Europe. If this be true it was undoubtedly introduced at an early date, probably not long after the first settlements. Micheaux collected it in the province of Quebec about 1792, also in other parts of Canada, and in Pennsylvania. Richardson, while accompanying the Franklin expedition in 1823, found it along the upper Saskatchewan in northwestern Canada; in fact it was found at an early date widely distributed in isolated locations unfrequented by the white man, which would indicate that it may be a native species. If it is not, its dissemination after introduction was a remarkably rapid one.

At present Canada bluegrass is nearly as widely distributed as Kentucky bluegrass, although not so plentiful or important. It is found in the greatest abundance in southern Ontario, Canada, and is also very common in New York, Pennsylvania, and the New England States. In certain sections of Virginia, West Virginia, Ohio, Indiana, and Missouri, and in fact in

many other States, it is also quite plentiful. In the Pacific Northwest it seems to be spreading rapidly. Its use as an adulterant of Kentucky bluegrass seed is doubtless responsible to some extent for its wide distribution, but it seems unlikely that it could have become distributed by this means to as great an extent as is generally believed.

FIG. 2.—A typical panicle of Kentucky bluegrass (*Poa pratensis* L.).

Soils containing considerable quantities of clay are the type of soil upon which Canada bluegrass is most commonly found. On stiff clay soils of low fertility it seems to thrive to a greater degree than any other grass. On the better classes of soils other grasses are usually more than able to hold their own against it. On gravelly clay soils it does well, but on sandy soils it is seldom found in abundance. It is interesting to note its behavior in sections favorable to the growth of Kentucky bluegrass. For example, in parts of Kentucky it is found in pure stands on the sides of cuts and other places where the soil is thin or the subsoil exposed, while the Kentucky bluegrass grows in pure stands on the good soil immediately adjacent. In general the two grasses are not found intermingled in the sod, but are in areas by themselves, although frequently the areas of either may be very small. The type of soil upon which Canada bluegrass reaches its greatest perfection in southern Ontario and western New

York is a clay soil classified by the Bureau of Soils of the United States Department of Agriculture as Dunkirk clay, or Dunkirk clay loam. This series of soils has been formed by the working over of glacial material derived probably from sandstone and clay.

An equable climate is not an essential factor to the growth of Canada bluegrass. It will withstand the low temperatures of the northern portion of the United States without injury. It is essentially a plant of the North Temperate Zone, extending far north in Siberia and Canada. Although apparently better able to withstand heat than Kentucky bluegrass, it is not found to any great extent in the Southern States. It is also more drought resistant than Kentucky bluegrass, but like the latter is practically dormant during the dry periods, coming on again with unimpaired vigor with the advent of rains. Its ability to thrive under adverse conditions makes it a valuable grass.

USES AND VALUE OF CANADA BLUEGRASS.

Regardless of the fact that Canada bluegrass is looked upon with disfavor in many localities, it is nevertheless very important. Like some other grasses of this country its value is belittled by the farmer because of its aggressiveness, which makes it a source of more or less constant trouble in some sections. This is generally true throughout the sections in which it is common.

It is perhaps unfortunate for Canada bluegrass that it should always be considered in comparison with Kentucky bluegrass, which is, broadly speaking, the best of the cultivated pasture grasses in this country. Such comparison has had a tendency to cause its real importance to be overlooked. It is true that the farming sections in the Kentucky bluegrass region are usually much more prosperous than the farming sections in which Canada bluegrass predominates, but nevertheless it is pretty generally true that where Canada bluegrass flourishes it is of more value agronomically than Kentucky bluegrass or than any other pasture grass would be on the same soil. In other words, Canada bluegrass can not compete with Kentucky bluegrass on good limestone soils, but on poor clay soils it is the more valuable of the two. Notwithstanding the prejudice against it, the practice of seeding it in some localities, notably in Ontario, is slowly but gradually increasing, which is an indication that its value is beginning to be more fully appreciated.

PASTURE.

Like Kentucky bluegrass, Canada bluegrass is primarily a pasture grass and is quite palatable to all kinds of live stock, perhaps slightly less so than Kentucky bluegrass, but equal to the average pasture

grass, especially if not allowed to become too mature. The high nutritive value of the grass offsets to a certain extent, at least, its comparatively low yield and makes it especially desirable for finishing beef cattle for market. In this connection the practice followed in western New York may be noted. It is a common practice upon farms having both Kentucky bluegrass and Canada bluegrass to graze the cattle that are to be exported in the fall on Kentucky bluegrass pasture during the forepart of the season, and in the latter part of the season to run them on pastures composed mostly of Canada bluegrass. The cattle of course are not kept off the Canada bluegrass pastures entirely during the early part of the season, as this would permit the grass to make a heavy growth unsuited for later grazing. However, the Canada bluegrass pastures are reserved

FIG. 3.—Pastures of Canada bluegrass. Live stock may be seen grazing on the closely pastured grass in preference to the grass that has been allowed to make a heavy growth.

for their heaviest grazing until the latter part of the season on account of their recognized value for finishing beef cattle for export.

When given their choice, live stock will graze on the closely pastured grass in preference to the grass that has been allowed to make a heavy growth. (See fig. 3.) Canada bluegrass can apparently be grazed more closely than other grasses with less ultimate damage, on account of its ability to recover and keep out weeds.

In certain sections, especially southern Ontario, wheat fields after harvest contain such a quantity of Canada bluegrass that in many cases they afford excellent grazing, as the grass which volunteers in the stubble is very palatable. (See fig. 4.) In midsummer the pastures often get so dry that they may be burned very readily, but even fire does not seem to injure them except for the time being. When

favorable weather returns, the grass grows again as vigorously as ever.

HAY.

There are comparatively few sections where Canada bluegrass is cut for hay, so that it can hardly be considered a hay grass. Under very favorable conditions yields of a ton to a ton and a half per acre are secured, but these are exceptions, the average being probably not more than one-half ton. It is on account of its low yield that it is not utilized as a hay grass, for it makes a very palatable hay and is above the average in feeding value. There is no definite market for the hay, but it has a ready local sale, and at points where it is well known it sells for nearly as high a price as timothy.

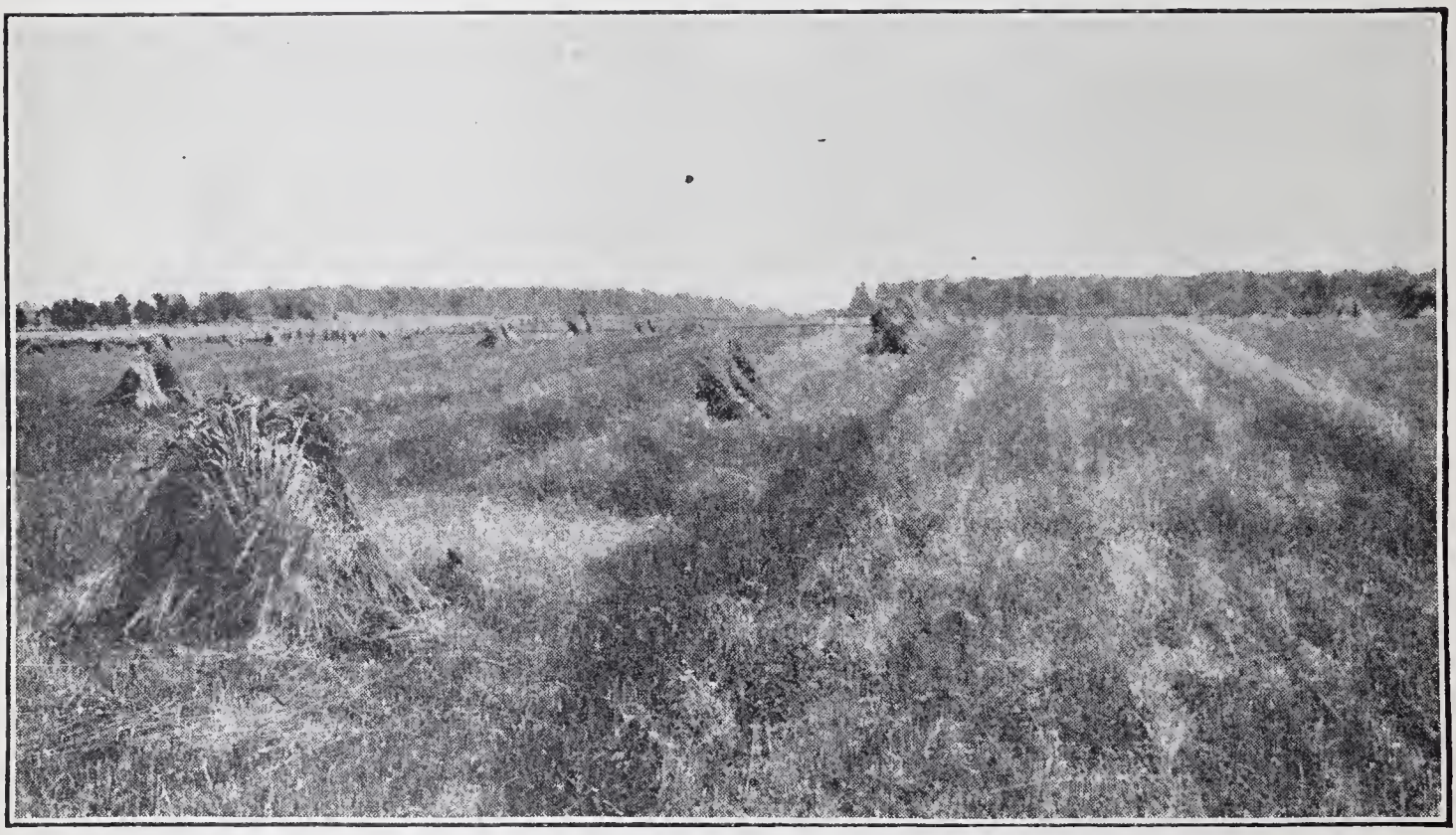

FIG. 4.—A field of wheat stubble, showing a heavy growth of volunteer Canada bluegrass.

At Fort Erie, Ontario, where a large number of race horses are stabled, Canada bluegrass is much in demand and is considered by the horsemen there to be quite valuable. Liverymen, however, usually prefer timothy, since it is a bulkier hay and can be used more economically in feeding to transient and boarding horses, and also because it can be fed without danger of serious results. Some care must be used in feeding Canada bluegrass hay, as it has a slight tendency to produce colic in horses if fed in large quantities.

If desired for hay, the grass should be cut a little before it has reached what is known as the "golden" stage. This is the stage at which it is cut for seed, but since it makes a very good hay when cut in the golden stage it is often left until then so that it may be thrashed if seed is desired.

When timothy, alsike clover, and Canada bluegrass are grown together, as is commonly the case, the combination makes a hay of excellent quality.

MISCELLANEOUS USES.

Use as a soil binder.—As a soil-binding grass on cuts and fills along railroads and in similar situations, Canada bluegrass can be used in many sections with good results. In such situations the soil is usually too poor to support a satisfactory growth of other grasses. The aggressiveness of the grass and its tough sod-forming habit make it of great value in preventing erosion.

Use for lawns and golf links.—Where Kentucky bluegrass can be grown with a reasonable degree of success Canada bluegrass can not be recommended as a lawn grass. The two grasses do not blend well, as in general they grow in patches by themselves, and because of the distinctly different color they make the lawn somewhat unsightly in this respect at least. They can, however, be used to advantage in combination in some cases, as, for example, on poor clay and gravel soils which become at times extremely dry. When used for either lawns or golf links Canada bluegrass should be kept very closely clipped, as otherwise it gets very wiry and makes a turf of poor texture. Unfortunately, when kept closely clipped it presents what might be called a dirty appearance, lacking that rich green color which makes Kentucky bluegrass so valuable.

It is hardly possible to make definite recommendations regarding the proportion of Canada bluegrass seed to be used in mixtures with other lawn grasses. Unless the soil is very poorly adapted to Kentucky bluegrass a mixture containing more than 10 per cent of Canada bluegrass seed is not advised.

Due to its superior resistance to drought and extended periods of hot weather, Canada bluegrass can doubtless be used farther south than Kentucky bluegrass. An agriculturist who has made a careful study of conditions in the Southern States for many years writes:

> Canada bluegrass has been noted somewhat abundantly in pastures and lawns in Alabama and Mississippi, probably having been introduced as an impurity in the seed of Kentucky bluegrass. Wherever observed in that region it has been superior to Kentucky bluegrass on account of its better resistance to the effects of drought and long-continued hot weather. There have been no attempts to grow this grass by itself, but the occasional patches and single plants which have been observed hold their own so well on dry clay soils that it appears well worth an extended test under such conditions.

These statements should in nowise be construed to justify the practice of using Canada bluegrass as an adulterant of Kentucky bluegrass for lawn purposes or for any other purpose. As is pointed

out, a combination of these grasses is advantageous only in a very few cases. When the purchaser really desires a mixture he should know definitely the proportions of each species in order that he may use them intelligently.

Use on scab lands.—In the northwestern portion of this country, especially in the States of Washington, Oregon, and Idaho, there are large areas of thin land where the underlying basalt frequently outcrops. These areas are called scab lands. The basalt is in many places entirely exposed or covered only with a very thin layer of soil. During the past few years Canada bluegrass has been tested on these lands and has proved quite promising. It seems more nearly adapted to the unfavorable conditions which exist in such sections than any of our other cultivated grasses. Its spreading, in some cases unassisted, is evidence of its adaptability. It is not believed that Canada bluegrass will make a heavy growth on these scab lands, but it is believed that in many sections it will prove profitable, inasmuch as it will at least furnish more and better grazing than the native vegetation.

COMMERCIAL SEED OF CANADA BLUEGRASS.

In its natural condition the seed of Canada bluegrass is readily distinguished from that of Kentucky bluegrass by the absence of the web of hairs at the base of the flowering glume, as well as by several less distinct characters. The color and shape of the seed differ in the two species, the color of the Canada bluegrass seed being usually a lighter shade of brown than that of Kentucky bluegrass, and the apex of the seed of the former having a tendency to be obtuse, while that of the latter is quite acute.

To distinguish between the commercial seeds of the two species is, however, quite a difficult matter. The thrashing and rubbing incident to the preparation of Kentucky bluegrass seed for the market removes the webby hairs and breaks the tips of the seeds in such a manner that they resemble those of Canada bluegrass very closely. The resemblance is so close that only those accustomed to handling both species can distinguish between them without making a critical examination. This has made the practice of using seed of Canada bluegrass as an adulterant of Kentucky bluegrass a comparatively easy matter.

The viability of commercial Canada bluegrass seed is much higher than that of Kentucky bluegrass seed. This fact is largely due to the methods used in harvesting and curing, descriptions of which will be given later. The average germination of Canada bluegrass seed is about 85 per cent and is reasonably constant, while the average of Kentucky bluegrass is only about 45 per cent and is so unreliable in

this respect that it is extremely unadvisable to buy or sow the seed without first testing its vitality thoroughly.

The difference in the methods of harvesting the two species of bluegrass is also responsible for the difference in price. While the difference in price varies considerably from year to year, depending on the supply and certain conditions of trade, Kentucky bluegrass seed usually sells for about 5 to 7 cents a pound more than Canada bluegrass seed.

Practically all of the Canada bluegrass seed used in this country is grown in the province of Ontario, Canada. The average importations for the years 1907, 1908, and 1909 have been approximately 650,000 pounds annually. While the seed is advertised in the trade as such, it may be stated with certainty that not more than 15 per cent of the quantity imported is sold to the ultimate consumer as Canada bluegrass, the remainder being used in varying proportions to adulterate Kentucky bluegrass seed. The increasing interest in pure seed is doubtless now having much to do in decreasing this harmful practice.

Attempts have been made by certain seedsmen to explain the presence of Canada bluegrass seed in commercial seed of Kentucky bluegrass on the ground that the former occurs commonly in fields of the latter; consequently the two are harvested together. It is true that some Canada bluegrass is found in the fields of Kentucky bluegrass harvested for seed, but since the former matures so much later than the latter there is no chance of mature seed of it becoming mixed with Kentucky bluegrass seed in this manner. A small amount of chaff from very immature seed of Canada bluegrass may be present, but even this is not common, since the Kentucky bluegrass seed if properly cleaned will have most of this material removed. In seed of Canada bluegrass, however, it is quite common to find Kentucky bluegrass seed, as some of the seed of the latter remains in the head sufficiently long after maturity to permit the harvesting of the two together.

HARVESTING THE SEED.

Harvesting the seed of Canada bluegrass is a comparatively simple matter. Strippers are not employed to strip the seed as in the case of Kentucky bluegrass, since the character of the seed makes this unnecessary. The webby hairs at the base of the seed of Kentucky bluegrass, which make harvesting and thrashing by ordinary means impracticable, are absent from Canada bluegrass seed. This allows the latter to be harvested in much the same manner as timothy, orchard grass, meadow fescue, and redtop.

The grass is considered ready to cut for seed when it has reached what is known as the "golden" stage, or when the seed has a deep

yellow color. This is a few days after it has reached the stage best suited for hay and occurs ordinarily from about July 10 to 15 in the northern portion of the United States. The seed crop is handled prior to thrashing in the same manner as hay. Since the grass is a little drier at the time of cutting for seed than at the time of cutting for hay it can be put up in shocks very soon after mowing. Grass cut in the morning may be put in shocks in the evening without danger of damage if the weather is favorable. It is desirable to put it in shocks as soon after cutting as possible to prevent the seed from shattering, since if left in the swath to cure it will shatter badly. Only a few days are necessary for curing in the shock, after which the grass is either stacked in ricks or barns or thrashed from the field.

FIG. 5.—A field showing a heavy volunteer growth of Canada bluegrass one year after a crop of wheat had been harvested.

Whether a field of Canada bluegrass is harvested for seed depends on the price of hay, the price of seed, and the yield which it will probably give. When hay is at a high price and seed only normal or below, only the fields that will give heavy yields are harvested for seed. These are usually new fields, as such almost invariably give higher yields of seed than those which have been down three or more years. Fields that have been allowed to lie four or more years ordinarily do not produce a sufficient quantity of seed to pay to thrash. An old field may yield a good crop of hay and still may not produce a paying crop of seed, as the seed heads produced are usually short and not well filled. The best fields of seed are often those that have volunteered on wheat stubble sowed with clover which failed to catch. Remarkably heavy stands of Canada bluegrass commonly

occur under such conditions the year following the removal of the small-grain crop. (See fig. 5.) There are frequently considerable quantities of timothy and white and alsike clover in fields which are harvested for seed, but these do not interfere with the harvesting or the preparation of the Canada bluegrass seed for the market.

THRASHING THE SEED.

Canada bluegrass is thrashed by the ordinary thrashing machine, either from the shock in the field shortly after harvesting or from the stack or barn during the fall or winter. No modification of the machine is necessary so far as the cylinder and concaves are concerned, but special screens are needed to put the seed in condition where it can be handled with a cleaning machine. No attempt, however, is made to clean the seed for market by means of the thrashing machine.

Considerable quantities of Canada bluegrass seed are secured from wheat at the time of thrashing, as the grass volunteers in wheat fields and is harvested with the wheat. This seed is saved by placing a screen in the bottom of the thrasher in such a manner as to separate it from the chaff and coarse inert material. On account of the grass being bound into bundles with the wheat it cures in ideal condition, and the seed at the time of thrashing is usually of excellent color and quality.

CLEANING THE SEED.

Seed as it comes from the thrashing machine is usually reasonably free from coarse inert matter, but is not in sufficiently good condition for the market. No difficulty, however, is experienced in cleaning it with a cleaning mill of the ordinary type. There are usually one or more farmers or retail seed dealers in each neighborhood equipped to clean the seed and act as middlemen between the growers and wholesale dealers.

With a cleaning machine of the type known commonly as a fanning mill and by the use of a one-twelfth-inch perforated screen above and a one-thirty-sixth-inch screen below and with a small amount of blast it is possible to reduce the percentage of inert matter to at least 5 per cent and that of the foreign seed, including weeds, to 6 per cent. The actual quantity of weed seed can be reduced to one-half of 1 per cent with very little loss of good seed and without requiring much time. The weed seeds most difficult to remove are cinquefoil (*Potentilla monspeliensis* L.), five-finger (*Potentilla canadensis* L.), red sorrel (*Rumex acetosella* L.), false flax (*Camelina microcarpa* Andrz.), mayweed (*Anthemis cotula* L.), and buckhorn (*Plantago lanceolata* L.). It does not seem practicable by means of present

methods and machinery to reduce the total percentage of weed seed much below one-half of 1 per cent. The remaining percentage of foreign seeds is composed mostly of timothy, alsike clover, and Kentucky bluegrass, the last named often running as high as 1 per cent.

Some seedsmen are using mills especially constructed for cleaning the seed. These mills are usually built in two parts, one called the rougher and the other the cleaner, or finisher. The rougher is used to remove the coarse, inert matter, and the finisher to remove the timothy, alsike, white clover, and various weed seeds which may be present.

On this type of machine no blast is used, but the riddles are usually more than twice as long as the ordinary screen, thus giving a much greater screening surface. By the use of such machines excellent work can be done in the way of cleaning, with probably less loss than with the fanning mill. The time required, however, in cleaning seed with a machine of this kind is much greater than it is where the blast is used. Seeds of timothy and alsike clover, which are commonly harvested with Canada bluegrass, are usually separated from it. Special attention is paid to separating the alsike clover, as it is more valuable than the grass seed. Farmers or seedsmen who make a practice of cleaning seed buy it from the growers either on the basis of clean seed or at a flat rate. The former practice, however, is more common.

The yield of seed per acre varies considerably, and it is extremely difficult to estimate the average. While it is possible to secure yields of 500 pounds per acre if conditions are favorable, the average yield does not exceed 200 pounds. It is estimated that a ton of hay upon which the seed is normally abundant will yield about 250 pounds. The recognized weight of seed per bushel is 14 pounds. The actual weight, however, of good seed is more than 20 pounds per bushel.

It is evident that a Canada bluegrass seed crop is not very profitable, since the average gross returns hardly exceed $10 per acre. Deducting the cost of handling, including thrashing and cleaning, this will not leave a large profit. However, the seed usually sells readily, and for this reason it is grown by farmers even though the profit is small.

HAY OF CANADA BLUEGRASS FROM WHICH SEED HAS BEEN THRASHED.

There is much difference of opinion in regard to the value of Canada bluegrass straw after the seed has been thrashed out. Some state that it is even more valuable than the hay, as it has the chaff

removed. However, it is generally considered less valuable than the hay, chiefly because it is cut at the stage of maturity which is a little too far in advance of the best stage for hay. If the straw is carefully stacked, however, it makes a good feed for both cattle and horses.

MANAGEMENT OF CANADA BLUEGRASS IN THE CROPPING SYSTEM.

SEEDING.

Little can be said regarding the management of Canada bluegrass in the cropping system in most sections, as it is utilized almost entirely for grazing and consequently does not enter into or influence the system

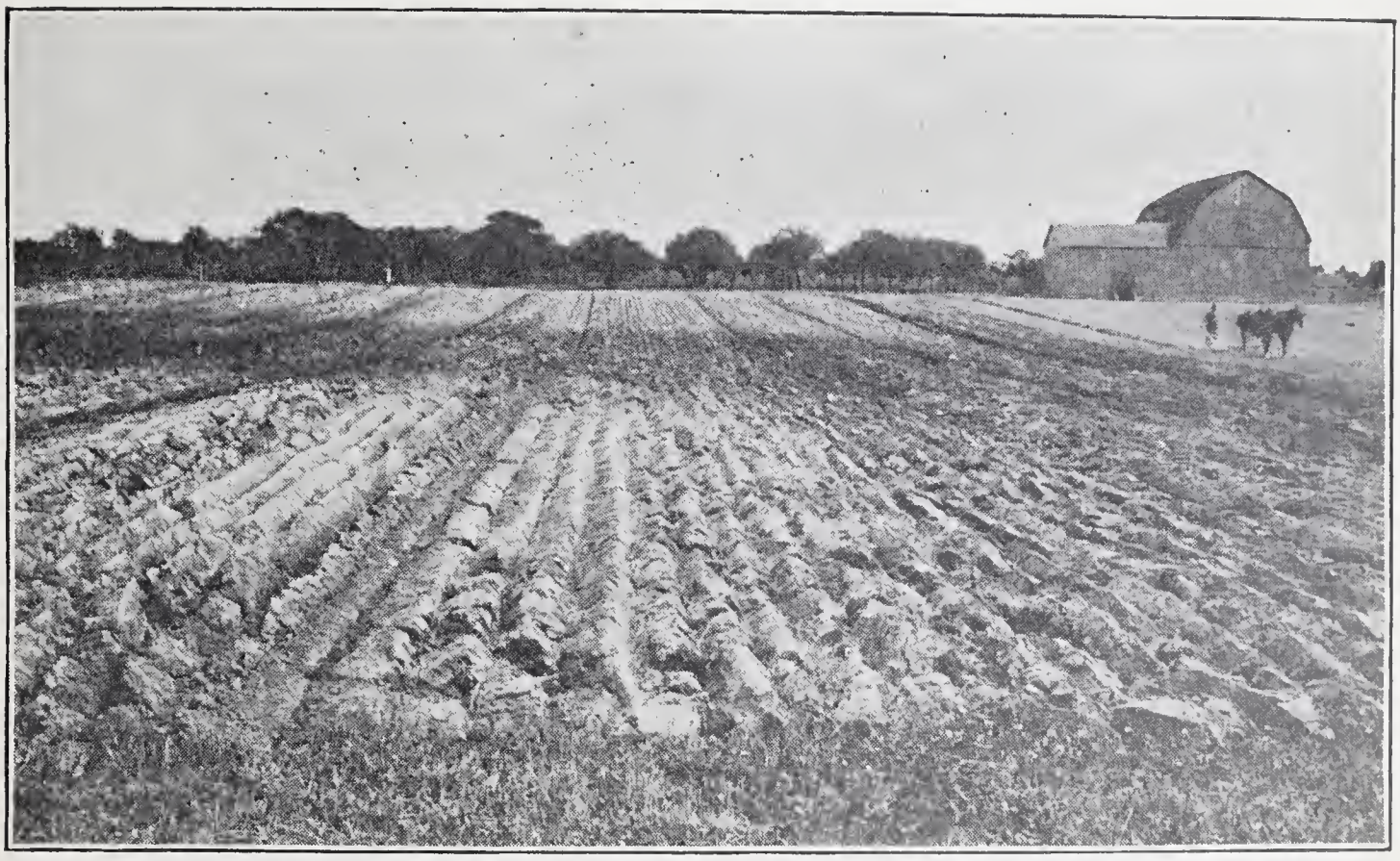

FIG. 6.—A field showing the sod of Canada bluegrass broken in such a manner as to allow this grass to become troublesome in the crop which is to follow.

of crop rotation to any great extent. In sections, however, where it is grown for hay or seed it is a more important factor in crop rotation.

There is comparatively little Canada bluegrass intentionally seeded, although there is without doubt more being seeded now than formerly. Farmers who have seeded the grass recommend the sowing of about 15 pounds of seed to the acre in the early spring on wheat, for although the grass volunteers readily in wheat fields the addition of seed practically insures a perfect stand the first year following the wheat crop. This practice applies to sections where the grass occurs commonly. In sections where it does not grow naturally in abundance, heavier seeding is recommended.

BREAKING UP OLD SOD.

When it becomes desirable to break up old sod it can be done most satisfactorily in the fall by plowing rather shallow and turning the sod completely. This smothers the grass quite effectually and at the same time exposes the roots pretty thoroughly, thus facilitating decomposition.

The sod is not hard to put in condition for a cultivated crop, and corn is probably the best crop to plant the spring after breaking up an old meadow or pasture. A common practice of breaking the sod by plowing a narrow furrow and turning on edge is thought by some of the best farmers to be responsible for a great deal of the difficulty experienced in keeping the grass in subjection on cultivated lands. When broken in this manner, the grass appears in rows as far apart as

FIG. 7.—A field of alfalfa, showing how the crop is crowded out by Canada bluegrass.

the width of the furrow and gets a good start before the field is harrowed or disked, and it is almost impossible to keep it out of the crop that follows. (See fig 6.) Farmers who break the sod by plowing a 10-inch to 14-inch furrow and turning it completely have very little trouble with the grass after breaking, especially if a disk harrow is used immediately after the sod is broken.

On account of the aggressiveness of Canada bluegrass its troublesome features can not be overlooked. It is certainly a decided menace in alfalfa fields, as it takes advantage of every opportunity to establish itself at the expense of the alfalfa. In Ontario large patches of Canada bluegrass are common in fields of alfalfa. (See fig. 7.) In most cases this is due to the fact that the field is poorly drained in such areas. In places where water stands on the field or ice is formed during the winter so that the alfalfa is killed or injured, Canada bluegrass is always at hand to establish itself on the bare spots. The

filling in of the vacant areas is an advantage rather than otherwise, but the crowding out of partially injured stands of alfalfa by the grass is decidedly detrimental.

SUMMARY.

Canada bluegrass has the same general distribution as Kentucky bluegrass, but is not so abundant. It is of the most importance in the New England States, New York, Pennsylvania, Virginia, West Virginia, and in southern Ontario in Canada. It is also common in parts of Ohio, Indiana, Illinois, and Missouri. It is found in the greatest abundance on various types of clay soil.

It can readily be distinguished from Kentucky bluegrass in a field by its dark-blue color, short leaves, flattened stem, and short, compact seed head.

Canada bluegrass is of value chiefly as a pasture grass and makes good grazing for all kinds of farm stock, especially beef and dairy cattle. The quality of hay produced is good, but the yield is not sufficiently high to make it of much value for this purpose.

As a soil-binding grass it is of considerable value on clay embankments, since it establishes itself readily and makes a tough sod that resists erosion.

Canada bluegrass should be used as a lawn grass only under few conditions, as it does not make a turf of good texture. On some clay soils it can be used to advantage either alone or in mixtures with other lawn grasses. It can also be used to advantage in some sections on golf links.

Seed of Canada bluegrass is harvested and thrashed in practically the same manner as timothy, orchard grass, or redtop, and for this reason it sells for much lower prices than Kentucky bluegrass. On account of the close resemblance between seed of Canada bluegrass and Kentucky bluegrass and also on account of the cheapness of the former, it is used very extensively as an adulterant of the latter. Most of the seed sold in this country is grown in lower Ontario, large quantities being imported each year.

Little difficulty is experienced in cleaning the seed of Canada bluegrass for market. By use of the ordinary fanning mill the quantity of inert matter can be reduced to at least 5 per cent and the weed seed to one-half of 1 per cent with very little loss of good seed.

The hay or straw from which seed is thrashed makes a very good roughage for live stock if properly handled, but is less valuable than the hay before thrashing.

Canada bluegrass volunteers readily, and chiefly for this reason there is very little seed sown. Where seeding is practiced, 15 pounds

or more per acre are recommended to be sown in the early spring on wheat.

When it becomes desirable to break up old sod it can be done to best advantage by plowing in the fall rather shallow and turning the furrow completely. This smothers the grass and at the same time exposes the roots to the action of the frost. Corn is probably the best crop to grow on sod land.

[A list giving the titles of all Farmers' Bulletins available for distribution will be sent free upon application to any Member of Congress or the Secretary of Agriculture.]

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